

## Remarks

This is in response to an Office Action in the above identified application dated March 20, 2008. The Applicants have attached a Petition for Extension of Time to Respond. The Applicants have included a payment of \$460 as a Large Entity.

The Examiner objected to Claims 35-51 and 53, 54 as being indefinite under 35 USC 112, second paragraph. The Examiner Rejected Claims 35-59 as being unpatentable over Satchell over Krause. The Applicants have cancelled Claims 35 – 59 and have added new claims 60 -72.

With regard to the Examiner's objection raised to the term "port former" in previous claim 53, that claim has been cancelled and the term "pore-former" does not appear in any of the newly filed claims.

Claim 60 has been amended in response to the objection under 35 USC § 112 that it is not clear how one forms a mixture of particles into a dough and that the term "dough" is not clearly defined and is indefinite. The Merriam-Webster online dictionary defines the term "dough" to mean a mixture that consists essentially of flour or meal and a liquid (as milk or water) and is stiff enough to knead or roll; something resembling dough especially in consistency. The term "dough" as used in claim 1 has substantially this well-recognized meaning. Applicants have responded to the objection by amending the claim to recite that liquid is added to the mixture of resin particles, secondary component and optionally novolak and that the mixture formed into dough.

Compared to previous claim 35, amendments have been introduced into new claim 60 in response to the objections of lack of novelty and lack of inventive step. The process has been defined as being for the production of a shaped porous material (see e.g. the title of the application and the immediately following reference to the production of "a complex shaped controlled porosity adsorbent material). The partial curing step has been specified as proceeding so as to give a resin solid that when ground can be sintered but cannot melt (Page 4 lines 8-10). The secondary

component has been defined to be a material that remains after pyrolysis, does not shrink during pyrolysis and is selected from activated carbon powder, graphite, a metal, a metal oxide, an inorganic oxide, silicon powder, silicon monoxide powder or a mixture of carbon and silicon and silica (see page 6 lines 21-23, page 7 lines 25-27, page 8 lines 19-20, page 9 line 16 – page 10 line 17) The claim has been further amended to make it explicit that there may also be present a novolak. The shaped product produced as a result of sintering has been defined as being form-stable, the pyrolysis step has been specified as involving heating to a carbonization temperature, and the carbonized material produced is defined as having the shape of the form-stabilized product (see the Examples and drawings).

Claim 61 is newly introduced and defines the temperature and duration of the partial curing step as being selected to give a sinterable product that when ground to give particles in the size range 106-250 µm and tabletted gives a pellet with a crush strength not less than 8 N/mm (page 4 lines 10-15).

Claim 62 specifies that the phenolic resin is a hexamine-cured novolak resin (page 4 lines 5-6).

Claim 63 specifies that the secondary component comprises a mesoporous activated carbon with a mean pore size in the 1-5 nm range (page 6 line 27). Claim 64 specifies that the secondary component is powdered graphite (page 6 line 23) claim 65 specifies that it is copper, aluminium or tungsten (page 8 lines 19-20; page 9 line 10) and claim 66 specifies that the secondary component is an amorphous oxide, a zeolite, a layered clay or silica (page 7 line 26).

Claim 67 specifies that the grinding operation comprises hammer milling followed by jet milling (page 11 lines 1-3), claim 68 specifies forming dough by mixing the resin particles, secondary component and any novolak with methyl cellulose, PEO and water (Example 1), claim 69 specifies that the mixture is shaped by extrusion (Example 1), claim 70 specifies that the pyrolysed material is activated using steam or carbon dioxide (page 8 line 1). Claim 71 specifies further heating at a temperature above 1000°C (page 8 line 5).

Claim 72 requires the secondary component to be present in the shaped and sintered material in an amount by volume of not more than 40% (page 6 line 5).

The Examiner has rejected Claims 35-59 that the claimed subject matter is unpatentable over Satchell EP 0254551 in view of Krause US 4220553.

As explained by the Examiner, Satchell teaches a porous phenolic resin article made by a method in which a partially cured phenolic resin solid is ground to form particles which are shaped into a solid product and subsequently sintered. However, as the Examiner acknowledges, Satchell nowhere discloses or suggests the addition of particles of secondary material. In particular with reference to the language of claim 60, it nowhere discloses or suggests the use of a secondary component that remains after pyrolysis, does not shrink during pyrolysis and is selected from activated carbon powder, graphite, a metal, a metal oxide, an inorganic oxide, silicon powder, silicon monoxide powder or a mixture of carbon and silicon and silica, and optionally a novolak.

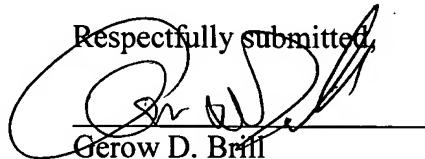
The Examiner relies on Krause for those claimed features which are absent from the Satchell disclosure. However Krause discloses no more than a porous block of particles held together by a cured resin binder. The block is heated to purge it of binder solvents but there is no disclosure or suggestion that a useful product could be obtained by pyrolysing the shaped solid product. It will be observed that amended wording of claim 60 specifies that the secondary material does not shrink during pyrolysis as explained at page 6 line 1 of the subject application, the sintered resin structure becomes carbonized and shrinks during pyrolysis by about 40%. Pyrolysis is a severe process which is in no way equivalent to merely curing a resin. It was not obvious prior to this invention that shaped articles of resin containing the presently specified secondary components could be made by firstly shaping a mixture of partially cured phenolic resin and secondary component to give a form-stable product and secondly pyrolysing the product at a carbonization temperature to give a product in which the form of the form stable resin precursor is retained. It is surprising that the resulting product is free from cracking or other sources of degradation in mechanical properties and that it has not simply shattered owing to the difference between the resin which shrinks 40% during carbonization and the precursor which does not undergo shrinkage.

The Examiner further rejected the claimed subject matter as being unpatentable with regard to Satchell in view of van der Smissen US Patent 4677096. However van der Smissen neither discloses nor suggests that a process such as that of Satchell could be operated using particles of copper or aluminium as secondary component to make a form-stable product that could be carbonized to give a product in which the shape of the form stabilised product is retained. It adds nothing to the disclosure of Krause.

The Examiner has stated that the structure and process of Satchell and Smissen are substantially similar to the claimed invention. However, as pointed out above, the present process produces a carbonised product that retains the shape of a form-stabilised sintered resin precursor notwithstanding the presence of a secondary component that does not shrink during carbonization. There is no way in which this result could have been predicted from the disclosures of Satchell and Smissen.

Since the claimed subject matter is novel and inventive over Satchell and Krause, there is no way in which it is obvious over these references plus the disclosure of Novack US 7014681 which is merely mentions silicon-based components without disclosing or suggesting a process such as claimed in claim 60.

The Applicants submit that the new claims are in form for Allowance. Based on these Remarks, the newly added claims the Applicants respectfully request reconsideration of the Application.

Respectfully submitted,  
  
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